

ERRATA

In the matter of

State of Oklahoma, ex rel., A. Drew Edmondson in his capacity as Attorney General of the State of Oklahoma, and Oklahoma Secretary of the Environment, C. MILES TOLBERT, in his capacity as the Trustee for Natural Resources for the State of Oklahoma, Plaintiffs

v.

Tyson Foods, Tyson Poultry, Tyson Chicken, Inc., Cobb-Vantress, Inc., Aviagen, Inc., Cal-Maine Foods, Cal-Mane Farms, Inc. Cargill, Inc., Cargill Turkey Products, LLC, George's, Inc., George's Farms, Inc., Peterson Farms, Inc., Simmons Foods, Inc. and Willowbrook Foods, Inc., Defendants.

CASE NO. 05-CV-329- GFK-SAJ

**in the United States District Court
for the Northern District of Oklahoma**

Expert Report

of

**J. Berton Fisher, Ph.D., CPG, RPG (TX #0201; MS#0301)
Lithochimeia, Inc.
110 West 7th Street, Suite 105
Tulsa, Oklahoma 74119
May 15, 2008**

Page 5

Original Text (Line 27)

21. Constituents of land disposed poultry waste run off fields and surface water and infiltrate through geologic media and contaminate ground water and are poorly attenuated.

Revised Text

21. Constituents of land disposed poultry waste run off fields and **into** surface water and infiltrate through geologic media and contaminate ground water and are poorly attenuated.

Reason

The word “**into**” has been added because it was inadvertently omitted in the original.

Page 6

Original Text (Line 17)

29. The change in sediment concentrations of and other poultry waste constituents within Lake Tenkiller sediments are directly related to changes in poultry production within the Illinois River Watershed.

Revised Text

29. The change in sediment concentrations of **phosphorus** and other poultry waste constituents within Lake Tenkiller sediments are directly related to changes in poultry production within the Illinois River Watershed.

Reason

The word “**phosphorus**” has been added because it was inadvertently omitted in the original.

Page 15

Original Text (footnotes)

40 Expert Report of G. Dennis Cooke and Eugene Welch, 2008.

42 Expert Report of Jan Stevenson, 2008.

Revised Text

40 Expert Report of Jan Stevenson, 2008.

42 Expert Report of G. Dennis Cooke and Eugene Welch, 2008.

Reason

The text for footnote 40 was inadvertently exchanged with the text for footnote 42 in the original.

Page 18

Original Text (footnotes)

49 Expert Report of Bernie Engle, 2008.

Revised Text

49 Expert Report of Valerie Harwood, 2008

Reason

Original footnote inadvertently referenced the Engle rather than the Harwood report.

Page 19

Original Text (Line 5)

An estimate of poultry production within the Illinois River Watershed based land use and

Revised Text

An estimate of poultry production within the Illinois River Watershed based **on** land use

Reason

The word “**on**” was added because it was inadvertently omitted in the original.

Page 36

Original Text (Line 12)

calcium (average = 27,869.40 mg/Kg)

Revised Text

calcium (average = 37,922.32 mg/Kg)

Reason

When possible, the standard practice for comparing compositional data for wastes and environmental media used in developing opinions expressed in this report was to compare data corrected to a dry weight basis. Due to a transcription error, the calcium data presented in text and in Table 10 were reported on an as received, or wet weight, basis. To conform to the methodology used in arriving at the opinions expressed in this report, the calcium data in text and in Table 10 (Page 37) have been revised to reflect the reported chemical composition on a dry weight basis. No change in the interpretation of the data or the conclusions reached resulted from these changes.

Original Text (Line 13-14)

potassium (average = 22,741.76 mg/Kg)

Revised Text

potassium (average = 29,008.56 mg/Kg)

Reason

When possible, the standard practice for comparing compositional data for wastes and environmental media used in developing opinions expressed in this report was to compare data corrected to a dry weight basis. Due to a transcription error, the potassium data presented in text and in Table 10 were reported on an as received, or wet weight, basis. To conform to the methodology used in arriving at the opinions expressed in this report, the potassium data in text and in Table 10 (Page 37) have been revised to reflect the reported chemical composition on a dry weight basis. No change in the interpretation of the data or the conclusions reached resulted from these changes.

Page 36 (cont.)

Original Text (Line 15)

total phosphorous (average = 15,183.44 mg/Kg)

Revised Text

total phosphorous (average = 19,723.31 mg/Kg)

Reason

When possible, the standard practice for comparing compositional data for wastes and environmental media used in developing opinions expressed in this report was to compare data corrected to a dry weight basis. Due to a transcription error, the total phosphorous data presented in text and in Table 10 were reported on an as received, or wet weight, basis. To conform to the methodology used in arriving at the opinions expressed in this report, the total phosphorous data in text and in Table 10 (Page 37) have been revised to reflect the reported chemical composition on a dry weight basis. No change in the interpretation of the data or the conclusions reached resulted from these changes.

Original Text (Line 17)

sodium (average = 5,971.42 mg/Kg)

Revised Text

sodium (average = 7,578.49 mg/Kg)

Reason

When possible, the standard practice for comparing compositional data for wastes and environmental media used in developing opinions expressed in this report was to compare data corrected to a dry weight basis. Due to a transcription error, the sodium data presented in text and in Table 10 were reported on an as received, or wet weight, basis. To conform to the methodology used in arriving at the opinions expressed in this report, the sodium data in text and in Table 10 (Page 37) have been revised to reflect the reported chemical composition on a dry weight basis. No change in the interpretation of the data or the conclusions reached resulted from these changes.

Page 36 (cont.)

Original Text (Line 18)

copper (average= 323.89 mg/Kg)

Revised Text

copper (average= 420.16 mg/Kg)

Reason

When possible, the standard practice for comparing compositional data for wastes and environmental media used in developing opinions expressed in this report was to compare data corrected to a dry weight basis. Due to a transcription error, the copper data presented in text and in Table 10 were reported on an as received, or wet weight, basis. To conform to the methodology used in arriving at the opinions expressed in this report, the copper data in text and in Table 10 (Page 37) have been revised to reflect the reported chemical composition on a dry weight basis. No change in the interpretation of the data or the conclusions reached resulted from these changes.

Original Text (Line 18-19)

zinc (average= 379.04 mg/Kg)

Revised Text

zinc (average= 488.47 mg/Kg)

Reason

When possible, the standard practice for comparing compositional data for wastes and environmental media used in developing opinions expressed in this report was to compare data corrected to a dry weight basis. Due to a transcription error, the zinc data presented in text and in Table 10 were reported on an as received, or wet weight, basis. To conform to the methodology used in arriving at the opinions expressed in this report, the zinc data in text and in Table 10 (Page 37) have been revised to reflect the reported chemical composition on a dry weight basis. No change in the interpretation of the data or the conclusions reached resulted from these changes.

Page 36 (cont.)

Original Text (Line 21-22)

arsenic was present (average = 16.14 mg/Kg)

Revised Text

arsenic was present (average = 19.75 mg/Kg)

Reason

When possible, the standard practice for comparing compositional data for wastes and environmental media used in developing opinions expressed in this report was to compare data corrected to a dry weight basis. Due to a transcription error, the arsenic data presented in text and in Table 10 were reported on an as received, or wet weight, basis. To conform to the methodology used in arriving at the opinions expressed in this report, the arsenic data in text and in Table 10 (Page 37) have been revised to reflect the reported chemical composition on a dry weight basis. No change in the interpretation of the data or the conclusions reached resulted from these changes.

Page 37

Original Text

The Max, Q3, Median, Average, Std. Dev., Q1, and Min values for all parameters (except Moisture) reported in Table 10 were corrected to reflect the composition of poultry waste analyses on a dry weight basis by dividing the as received analytical value by the solids fraction $(100 - \text{Moisture}\%) / 100$. The Obs. Value for Organic Matter was changed to 22 from 25.

Revised Text

The revised text (i.e. substitute page) follows this page

Reason

When possible, the standard practice for comparing compositional data for wastes and environmental media used in developing opinions expressed in this report was to compare data corrected to a dry weight basis. Due to a transcription error, the data presented in text and in Table 10 were reported on an as received, or wet weight, basis. To conform to the methodology used in arriving at the opinions expressed in this report, the data in text and in Table 10 (Page 37) have been revised to reflect the reported chemical composition on a dry weight basis. Due to a transcription error the number of analyses for Organic Matter % was incorrectly reported in Table 10 as 25; there were actually 22 analyses of Organic Matter %. No change in the interpretation of the data or the conclusions reached resulted from these changes.

Poultry have low body retention of trace elements. For example, poultry retain only about 6% of the Cu and Zn that they are fed. This low body retention is mainly ascribed to the relatively high dietary intakes of trace elements because poultry diets contain trace elements far in excess of dietary requirements.⁹⁵ It is not surprising, therefore, that the

Table 10. Summary Statistics for the Composition of 25 Samples of Poultry Waste Collected by CDM⁹⁶

Parameter	Units	Obs.	ND	Max	Q3	Median	Average	Std. Dev.	Q1	Min
Moisture	%	25	0	70.60	23.30	18.80	20.73	14.14	13.70	5.28
Organic Matter	%	22	0	236.73	102.97	93.65	95.51	35.64	76.49	52.05
Total Calcium	mg/Kg	25	0	152401.75	41466.67	34282.33	37922.32	26208.46	25531.91	8721.62
Nitrogen Total (Inorganic + Organic)	mg/Kg	25	0	46630.73	44292.24	36423.14	31726.81	15288.06	23066.67	2631.58
Total Potassium	mg/Kg	25	0	46305.42	35152.84	28933.33	29008.56	9435.27	25092.71	1771.63
Total P (6020)	mg/Kg	25	0	30559.17	25899.28	21470.94	19723.31	7393.77	15824.92	4931.03
Phosphorus (Mehlich 3)	mg/Kg	25	0	28646.29	7038.46	4284.43	6291.62	5767.89	2732.12	435.10
Phosphorus (Water Soluble)	mg/Kg	25	0	8639.46	1569.79	830.67	1699.11	1966.97	561.17	91.35
Total Sodium	mg/Kg	25	0	13793.10	8782.35	7415.31	7578.49	2898.14	6240.18	90.87
Total Magnesium	mg/Kg	25	0	8853.33	7473.56	6531.94	6442.42	1674.77	5016.80	2313.46
Sulfate (Water Soluble)	mg/Kg	25	1	8940.73	4826.67	3898.31	3759.88	2317.39	1657.52	12.02
Chloride (Water Soluble)	mg/Kg	25	1	7402.27	4564.37	3850.23	3508.86	1793.59	1930.46	60.10
Total Aluminum	mg/Kg	25	2	9927.23	2233.38	1329.93	2052.68	2244.41	640.64	185.41
Ammonium (Water Soluble)	mg/Kg	25	1	8475.03	3306.67	1310.90	2138.35	2260.70	594.34	6.01
Total Iron	mg/Kg	25	0	6712.28	1474.33	1045.33	1442.77	1408.83	613.39	336.22
Total Manganese	mg/Kg	25	0	1268.00	835.36	727.83	718.89	222.60	575.91	345.71
Total Zinc	mg/Kg	25	0	741.33	600.00	507.00	488.47	171.79	410.20	115.50
Total Copper	mg/Kg	25	0	700.87	530.79	455.13	420.16	155.58	382.67	24.28
Total Barium	mg/Kg	25	0	197.12	60.92	41.50	52.14	33.56	35.84	25.34
Total Arsenic	mg/Kg	25	4	48.58	33.11	21.01	19.75	16.47	3.07	0.60
Total Vanadium	mg/Kg	25	6	160.26	13.75	6.52	20.50	36.97	5.61	2.65
Total Nickel	mg/Kg	25	0	19.17	15.47	13.34	13.14	3.82	10.21	3.77

levels of trace elements such as Zn, Cu, and Mn in poultry waste are far in excess of crop

95 Van der Klis, J. D. and P. A. Kemme. 2002. An appraisal of trace elements: Inorganic and organic (Chapter 6) in: McNab, J. M. and K. N. Boorman, eds.. Poultry Feedstuffs, Supply, Composition and Nutritive Value. Poultry Science Symposium Series, Vol. 26., CABI Publishing, New York.

96 Sample IDs: Litter 3, Litter 4, Litter 2, Litter 5, FAC 01A (020206-Normal 1), FAC 01B (020206-Normal 2), FAC-06, FAC-04, FAC-05, FAC1, FAC2, FAC-07, FAC-03, FAC-08, FAC09, FAC-10, LAL1-A-Compost, FAC 1-C (020206-Cake), FAC-11, FAC-12-113007, FAC-12-112907, FAC-14, FAC-15, FAC-16, FAC-17.

Page 38

Original Text (Line 2 of Table 11 caption)

Eucha/Spavianw

Revised Text

Eucha/Spavinaw

Reason

Corrects spelling of “Spavinaw”.

Page 39 through Page 41

Original Text

The original text, including Table 12, is replaced with the following pages (modified information is highlighted in the text and in Table 12).

Revised Text

The revised text (i.e. substitute pages) follows this page.

Reason

Due to an inadvertent data transcription error, the wrong data for Total P was used in the original calculations of the following ratios:

- Total Zn / Total P,
- Total Cu / Total P, and;
- Total As / Total P.

To correct this inadvertent data transcription error, these ratio calculations were done using the correct values for Total P. The revised text and the revised Table 12 were provided to Defendants during my deposition (September 3-4, 2008). Note that Total Zn/Total Cu ratios were also corrected for waste water treatment plant effluent and that Total Zn/Total Cu ratios are reported to four decimal places to be consistent with the reporting of the other ratios. These changes did not alter my Opinion 18 that the chemical composition of poultry waste is distinctly different from the chemical composition of cattle waste and waste water treatment plant effluent.

diets is 30 mg Zn/kg.¹⁰⁰ The consequent Zn:Cu ratio in a beef cattle diet is 3:1. The ratio of Zn to Cu in cattle waste samples collected in the Illinois River Watershed by CDM ranged from 4.237:1 to 8.901:1 with an average value of 6.102:1. In contrast, the analysis of poultry feed obtained by CDM¹⁰¹ had a measured zinc concentration of 128 mg/kg and a measured copper concentration of 119 mg/kg or a Zn:Cu ratio of 1.076:1, a value very different from those in beef cattle diets or in cattle waste, but quite similar to the Zn:Cu ratio of 1.317:1 for the average values of Zn and Cu measured by CDM in poultry wastes.

18. The chemical composition of poultry waste is distinctly different from the chemical composition of cattle waste and waste water treatment plant effluent.

Crossplots of Total P, Total Zn, Total Cu and Total As that compare poultry waste, cattle waste and wastewater treatment plant effluent are provided in Fig 8.¹⁰² Cattle waste is chemically distinguishable from poultry waste. Cattle waste contained substantially less (on average ~ 16 times less on a wet weight basis and ~4.6 times less on a dry weight basis) Total P per unit mass than poultry waste, and contained no detectable Total As. Further, cattle waste contains much less Total Zn and Total Cu than poultry waste and the ratio of Total Zn to Total Cu in cattle waste is larger than the ratio of Total Zn to Total Cu found for poultry waste (6.1 vs. 1.3). Wastewater treatment plant effluent is also chemically distinguishable from poultry waste. Compared to poultry waste, wastewater treatment plant effluent is depleted in Cu with respect to P, enriched in Zn and As with respect to P and is depleted in Cu with respect to Zn compared to poultry waste.

Data concerning the ratios Total Zn/Total P, Total Cu/Total P, Total As/Total P and Total Zn/Total Cu in poultry waste, cattle waste and wastewater treatment plant effluent are given

100 See Chapter 5, National Research Council , 2000. Nutrient Requirements of Beef Cattle: Seventh Revised Edition: Update 2000, National Academy Press, 232 pp.

101 Sample ID FAC 01-FEED.

102 Sample IDs: Litter 3, Litter 4, Litter 2, Litter 5, FAC 01A (020206-Normal 1), FAC 01B (020206-Normal 2), FAC-06, FAC-04, FAC-05, FAC1, FAC2, FAC-07, FAC-03, FAC-08, FAC09, FAC-10, LAL1-A-Compost, FAC 1-C (020206-Cake), FAC-11, FAC-12-113007, FAC-12-112907, FAC-14, FAC-15, FAC-16, FAC-17; MAN-BC-20D; MAN-BC-20F; MAN-BC-21D; MAN-BC-21F; MAN-BC-22D; MAN-BC-22F; MAN-BC-23D; MAN-BC-23F; MAN-BC-24D; MAN-BC-24F; MAN-BG-20F; Lincoln WWTP-01 Non-filtered; Rogers WWTP Non-filtered; Silom Springs WWTP Non-filtered; Springdale WWTP Non-filtered , Lincoln WWTP-01.

in Table 12. The ratio of Zn to P (Zn/P) in poultry waste ranged between 0.0107:1 and 0.0322:1 with an average value of 0.0253:1. In comparison, the ratio of Zn to P in cattle waste ranged from 0.0107:1 to 0.0375:1 with an average value of 0.0199:1 while in wastewater treatment plant effluent (unfiltered) the ratio of Zn to P ranged from 0.0108:1 to 0.3293:1 with an average value of 0.1605:1. With respect to P then, on average, Zn is approximately 1.3 times more abundant in poultry waste than in cattle waste and more than 6.3 times more abundant in wastewater treatment plant effluent than in poultry waste.

The ratio of Cu to P (Cu/P) in poultry waste ranged between 0.0045:1 and 0.0282:1 with an average value of 0.0213:1. In comparison, the ratio of Cu to P in cattle waste ranged from 0.0019:1 to 0.0051:1 with an average value of 0.0032:1 while in wastewater treatment plant effluent (unfiltered) the ratio of Cu to P ranged from 0.0015:1 to 0.0178:1 with an average value of 0.0061. With respect to P then, on average, Cu is approximately 2.7 times more abundant in poultry waste than in cattle waste and 6.7 times more abundant in poultry waste than in wastewater treatment plant effluent.

The ratio of As to P (As/P) in poultry waste ranged between 0.00002:1 and 0.0022:1 and had an average value of 0.0010:1. In comparison, no arsenic was detected in cattle waste; while in wastewater treatment plant effluent (unfiltered) the ratio of As to P ranged from 0.0004:1 to 0.0103:1 with an average value of 0.0060:1. With respect to P then, As is approximately 6 times more abundant in wastewater treatment plant effluent than in poultry waste.

The ratio of Zn to Cu (Zn/Cu) in poultry waste ranged between 0.8933:1 and 4.7574:1 with an average value of 1.3174:1. In comparison, the ratio of Zn to Cu in cattle waste ranged from 4.2376:1 to 8.9011:1 with an average value of 6.1021:1 while in wastewater treatment plant effluent (unfiltered) the ratio of Zn to Cu ranged from 7.2854:1 to 57.3148:1 with an average value of 22.6576:1. With respect to Cu then, on average, Zn is approximately 4.6

times more abundant in poultry waste than in cattle waste and 17.2 times more abundant in wastewater treatment effluent than in poultry waste.

Given these differences in chemical ratios, these wastes are distinctly different from one another, and these differences can be used to identify the presence of these wastes in environmental samples.

Table 12. Ratios of Total Zn/Total P, Total Cu/Total P, Total As/Total P and Total Zn/Total Cu for Poultry Waste, Cattle Waste and Wastewater Treatment Plant Effluent (unfiltered)					
		Total Zn / Total P	Total Cu/Total P	Total As/Total P	Total Zn/Total Cu
Poultry Waste	Maximum	0.0322	0.0282	0.0022	4.7574
	Q3	0.0273	0.0242	0.0019	1.3673
	Mean	0.0253	0.0213	0.0010	1.3174
	Median	0.0260	0.0220	0.0009	1.1149
	Q1	0.0216	0.0192	0.0002	1.0343
	Minimum	0.0174	0.0045	0.00002	0.8933
Cattle Waste	Maximum	0.0375	0.0051	As not detected	8.9011
	Q3	0.0276	0.0040	As not detected	6.8515
	Mean	0.0199	0.0032	As not detected	6.1021
	Median	0.0157	0.0030	As not detected	5.9554
	Q1	0.0131	0.0024	As not detected	5.4308
	Minimum	0.0107	0.0019	As not detected	4.2367
Wastewater Treatment Plant Effluent	Maximum	0.3293	0.0178	0.0103	57.3148
	Q3	0.2405	0.0093	0.0076	24.9716
	Mean	0.1605	0.0079	0.0060	22.6576
	Median	0.1509	0.0061	0.0065	13.0150
	Q1	0.0708	0.0047	0.0049	10.7011
	Minimum	0.0108	0.0015	0.0004	7.2854

19. The geology of the Illinois River Watershed produces a circumstance in which both the surface and ground water within the Illinois River Watershed are highly susceptible to pollution from the constituents of land applied poultry waste. The Illinois River Watershed contains approximately 1,672 mi² (1,069,530 acres), and lies within the southwestern portion (Springfield Plateau) of the Ozark Uplift physiographic province within portions of Washington and Benton Counties in Arkansas and Delaware, Adair,

Page 52

Original Text (Line 21)

samples and the concentrations of concentrations of total phosphorus, total copper, total zinc and

Revised Text

samples and the concentrations ~~of concentrations~~ of total phosphorus, total copper, total zinc and

Reason

The words “~~of concentrations~~” are a typographical error.

Page 54

Original Text (Line 3)

dated sediment cores to reconstruct pollution histories reservoirs, as well as lakes, marine

Revised Text

dated sediment cores to reconstruct pollution histories **of** reservoirs, as well as lakes, marine

Reason

The word “**of**” was added because it was inadvertently omitted in the original.

Original Text (Line 11)

using an Edgetech Model Xstar system was with a model SB216 towfish (operating

Revised Text

using an Edgetech Model Xstar system ~~was~~ with a model SB216 towfish (operating

Reason

The word “**was**” was removed because it was inadvertently inserted in the original.

Page 56

Original Text (Line 4)

atmospheric releases form the nuclear accident at Chernobyl

Revised Text

atmospheric releases **from** the nuclear accident at Chernobyl

Reason

The word “**from**” replaces the word “form” in the original because it corrects a typographical error.

Original Text (Line 7)

the amount of “unsupported” ²¹⁰Pb found in the sediments.

Revised Text

on the amount of “unsupported” ²¹⁰Pb found in the sediments.

Reason

The word “**on**” was added because it was inadvertently omitted in the original.

Page 58

Original Text (Line 16)

concentrations found surface

Revised Text

concentrations found **in** surface

Reason

The word “**in**” was added because it was inadvertently omitted in the original.

Page 59

Original Text (Line 7)

between 9.38 and 17.5 mg/kg

Revised Text

between 9.38 and 17.6 mg/kg

Reason

The number 17.5 was changed to 17.6 to correct a typographical error.

Original Text (Line 7-8)

As can be seen in Fig 20

Revised Text

As can be seen in Fig 30

Reason

The figure reference was changed to correct a typographical error.

Page 61

Original Text (Line 8)

Total P in relative to a mixture of uncontaminated soils

Revised Text

Total P ~~in~~ relative to a mixture of uncontaminated soils

Reason

The word “in” was removed because it was inadvertently inserted in the original.

Original Text (Line 12)

29. The change in sediment concentrations of and other poultry waste

Revised Text

29. The change in sediment concentrations of ~~phosphorus~~ and other poultry waste

Reason

The word “phosphorus” was added because it was inadvertently omitted in the original.

FIGURE 8

Relationship between the concentrations of total phosphorus, total copper, total zinc and total arsenic found in poultry waste, cattle waste and unfiltered wastewater treatment plant effluent.

Changes

Re-plotted poultry waste data and cattle waste data to reflect correction of data to a dry weight basis using reported moisture content. Recalculated regression lines relating Total Cu to Total Zn.

Reason

Original plot displayed “as received” data (not corrected for moisture content); recalculating data to a dry weight basis reduces variability and allows for consistent comparison among data. These changes resulting from the recalculation of the poultry and cattle waste analyses to a dry weight basis are discussed and/or related to Errata for Page 36, Page 37 and Pages 39 through 41.

Change in interpretation

No change in the interpretation of Figure 8.

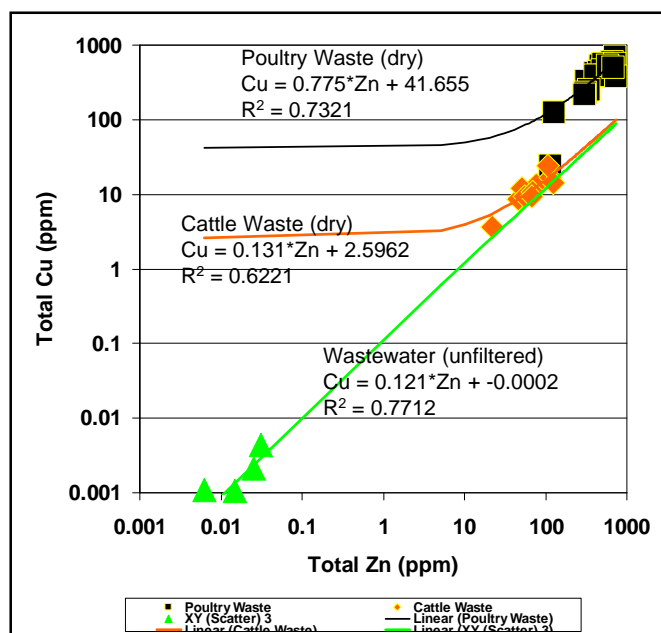
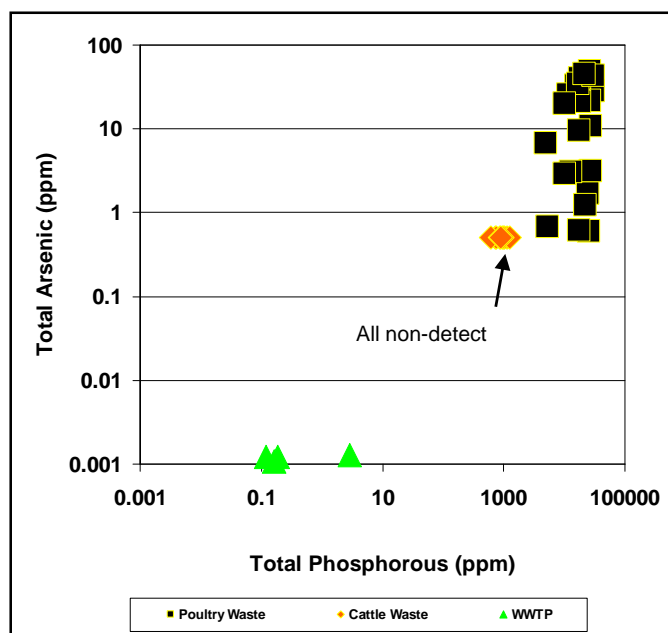
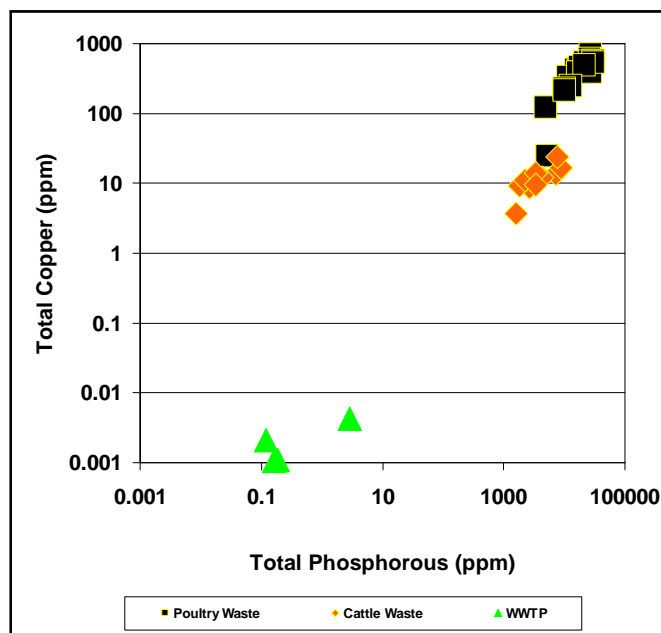
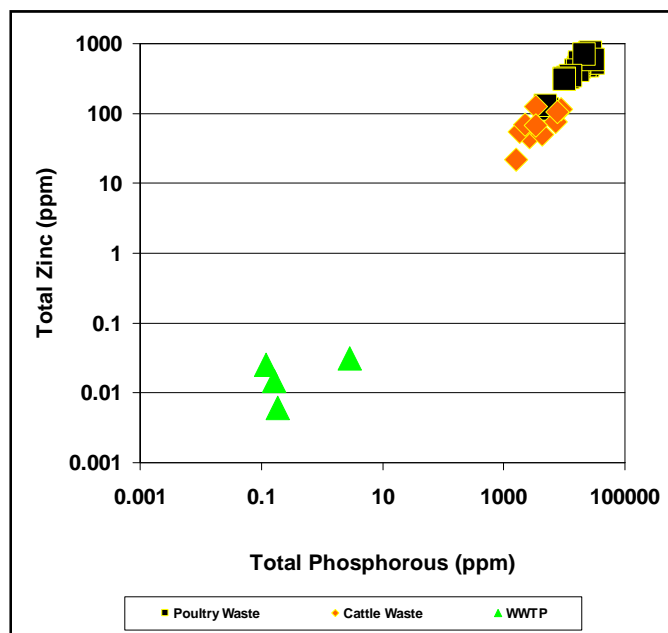


Figure 8. Relationship between the concentrations of total phosphorus, total copper, total zinc and total arsenic found in poultry waste, cattle waste and unfiltered wastewater treatment plant effluent.

FIGURE 17

Relationship between the concentrations of total phosphorus, total copper, total zinc and total arsenic found in litter application location (LAL) soil samples (0-2" collection depth) and poultry waste.

Changes

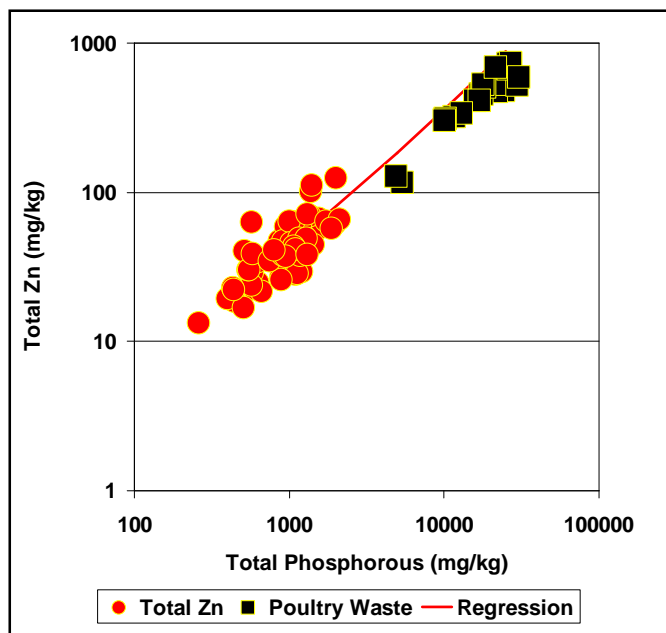
Re-plotted poultry waste data to reflect correction of data to a dry weight basis using reported moisture content.

Reason

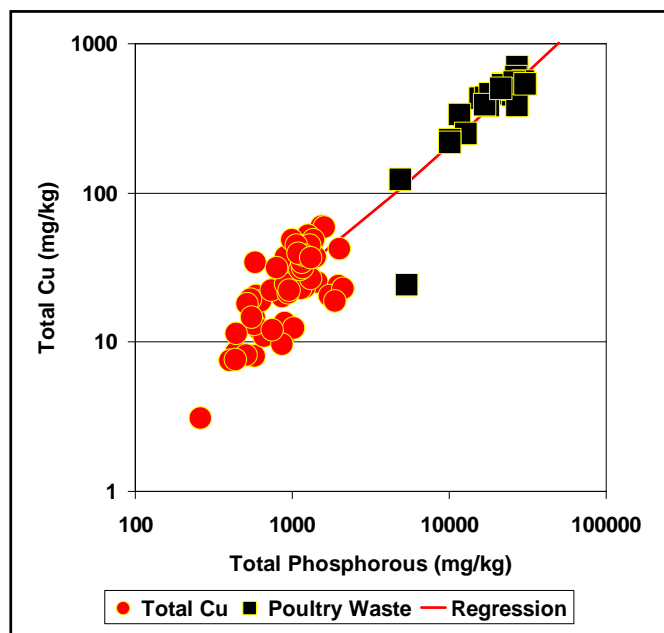
Original plot displayed "as received" data (not corrected for moisture content); recalculating data to a dry weight basis reduces variability and allows for consistent comparison among data. These changes resulting from the recalculation of the poultry and cattle waste analyses to a dry weight basis are discussed and/or related to Errata for Page 36, Page 37 and Pages 39 through 41.

Change in interpretation

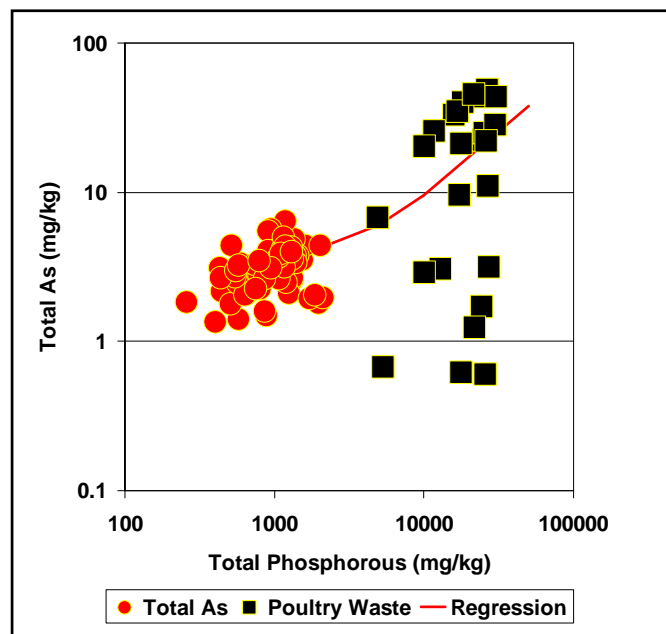
No change in the interpretation of Figure 17.



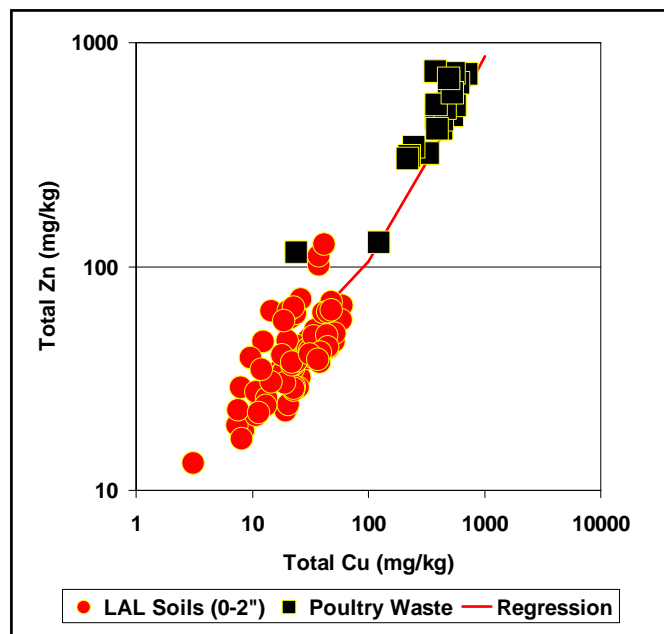
Regression: Total Zn = 0.0351*Total P + 8.030



Regression: Total Cu = 0.0202*Total P + 6.728



Regression: Total As = 0.0007*Total P + 2.523



Regression: Total Zn = 0.846*Total Cu + 20.994

Figure 17. Relationship between the concentrations of total phosphorus, total copper, total zinc and total arsenic found in litter application location (LAL) soil samples (0-2\" collection depth) and poultry waste.

FIGURE 20

Relationship between the concentrations of total phosphorus, total copper, total zinc and total arsenic found in edge of field runoff samples (EOF) and poultry waste.

Changes

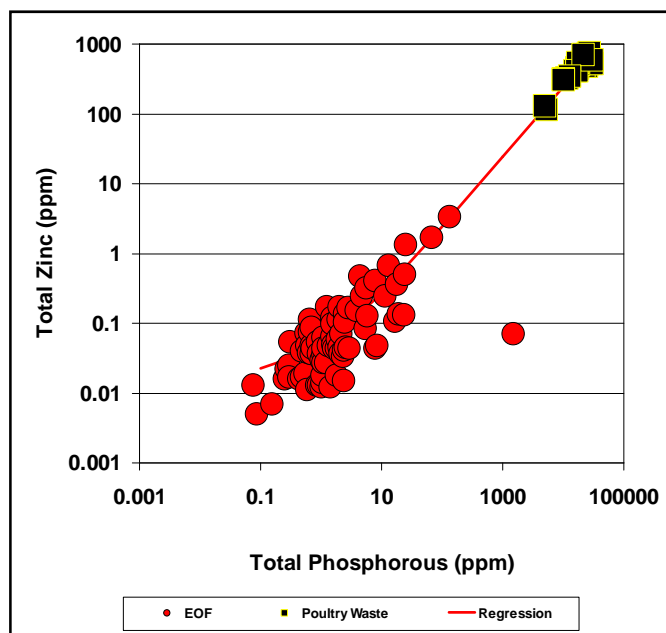
Re-plotted poultry waste data to reflect correction of data to a dry weight basis using reported moisture content.

Reason

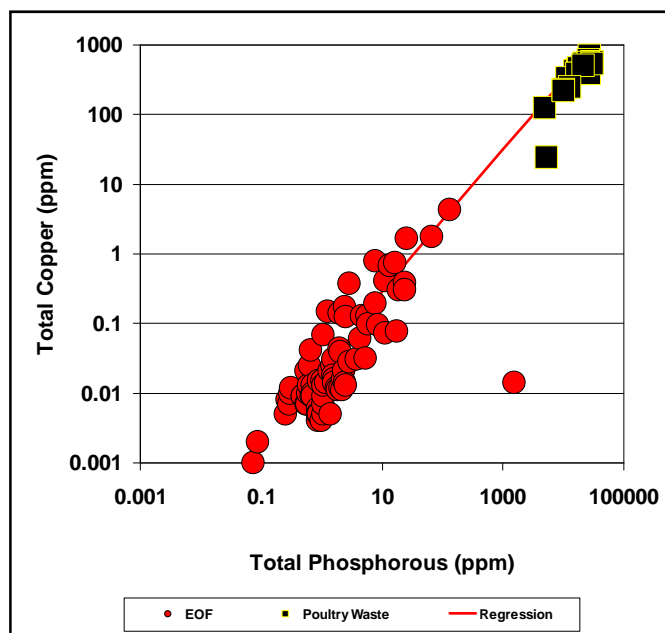
Original plot displayed “as received” data (i.e. not corrected for moisture content); re-calculating data to a dry weight basis reduces variability and allows for consistent comparison among data. These changes resulting from the recalculation of the poultry and cattle waste analyses to a dry weight basis are discussed and/or related to Errata for Page 36, Page 37 and Pages 39 through 41.

Change in interpretation

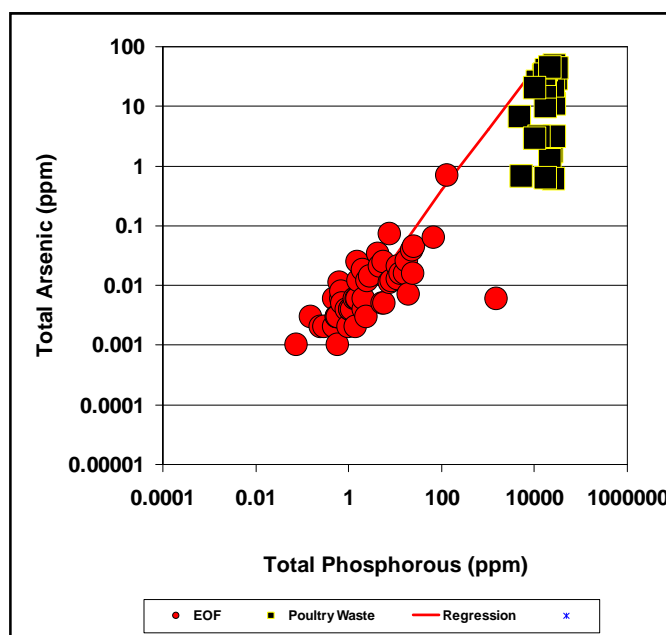
No change in the interpretation of Figure 20.



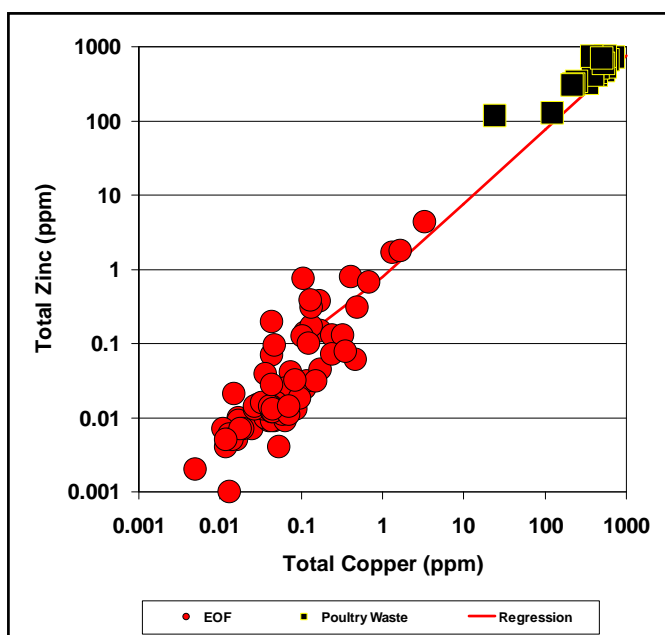
Regression: Total Zn = 0.0246*Total P + 0.0204



Regression: Total Cu = 0.0313*Total P - 0.0156



Regression: Total As = 0.0041*Total P + 0.0104



Regression: Total Zn = 0.759*Total Cu + 0.0387

Figure 20. Relationship between the concentrations of total phosphorus, total copper, total zinc and total arsenic found in edge of field runoff samples (EOF) and poultry waste.

FIGURE 24

Relationship between the concentrations of total phosphorus, total copper, total zinc and total arsenic in sediments collected from Illinois River Watershed streams, control soils and in poultry waste.

Changes

Re-plotted poultry waste data to reflect the correction of these data to a dry weight basis using the reported moisture content; re-calculated mixing line to reflect mixing between uncontaminated soil data and dry basis poultry data.

Reason

Original plot displayed “as received” data (i.e. not corrected for moisture content); re-calculating data to a dry weight basis reduces variability and allows for consistent comparison among data. These changes resulting from the recalculation of the poultry and cattle waste analyses to a dry weight basis are discussed and/or related to Errata for Page 36, Page 37 and Pages 39 through 41.

Change in interpretation

No change in the interpretation of Figure 24.

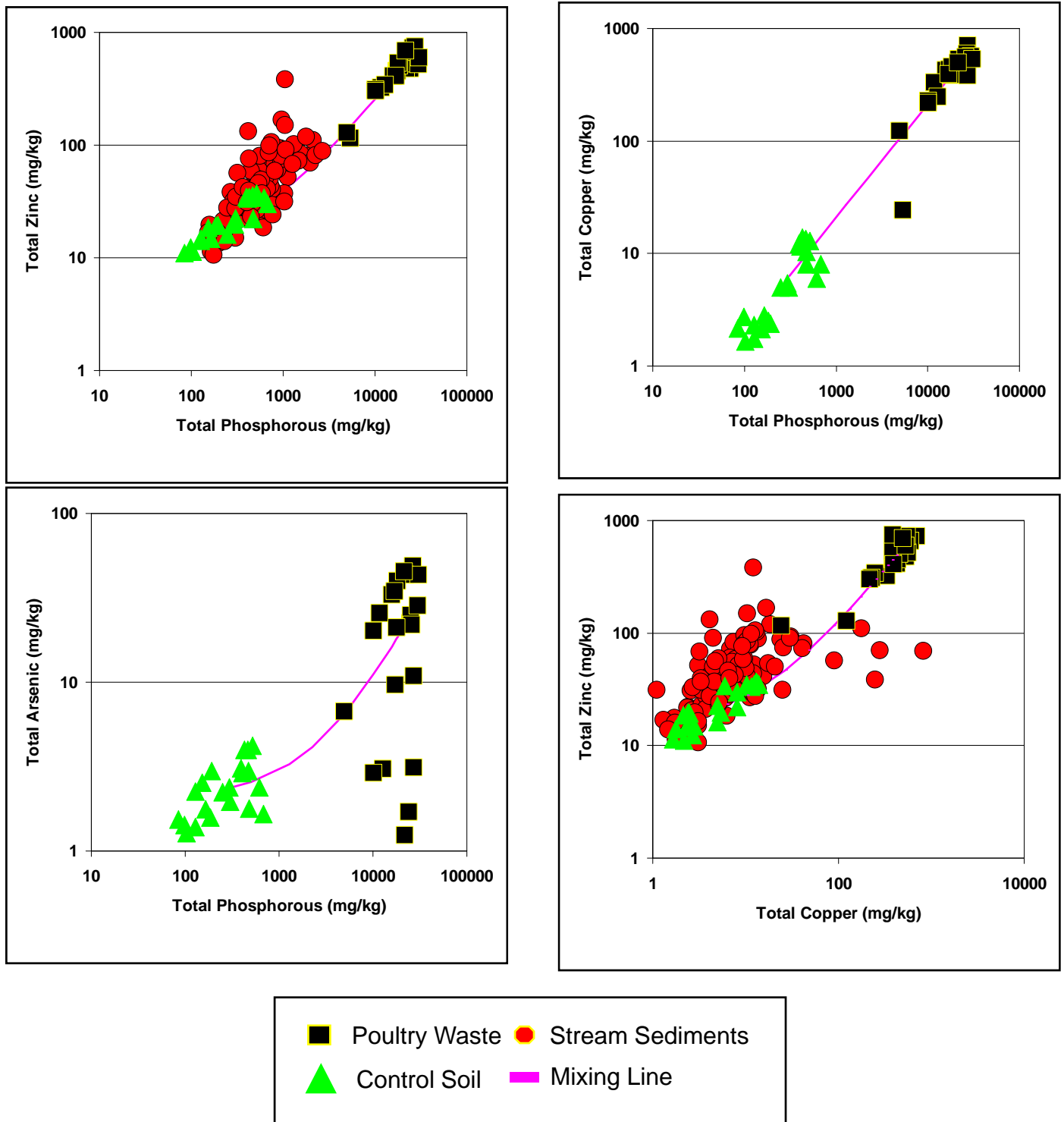


Figure 24. Relationship between the concentrations of total phosphorus, total copper, total zinc and total arsenic in sediments collected form Illinois River Watershed streams, control soils and in poultry waste.

FIGURE 32

Relationship between the concentrations of total phosphorus, total copper, total zinc and total arsenic found in sediments collected in Lake Tenkiller sediment cores, uncontaminated soils and in poultry waste.

Change

Re-plotted poultry waste data to reflect the correction of these data to a dry weight basis using the reported moisture content; re-calculated mixing line to reflect mixing between uncontaminated soil data and dry basis poultry data.

Reason

Original plot displayed “as received” data (i.e. not corrected for moisture content); re-calculating the data to a dry weight basis reduces variability and allows for consistent comparison among data. These changes resulting from the recalculation of the poultry and cattle waste analyses to a dry weight basis are discussed and/or related to Errata for Page 36, Page 37 and Pages 39 through 41.

Change in interpretation

No change in the interpretation of Figure 32.

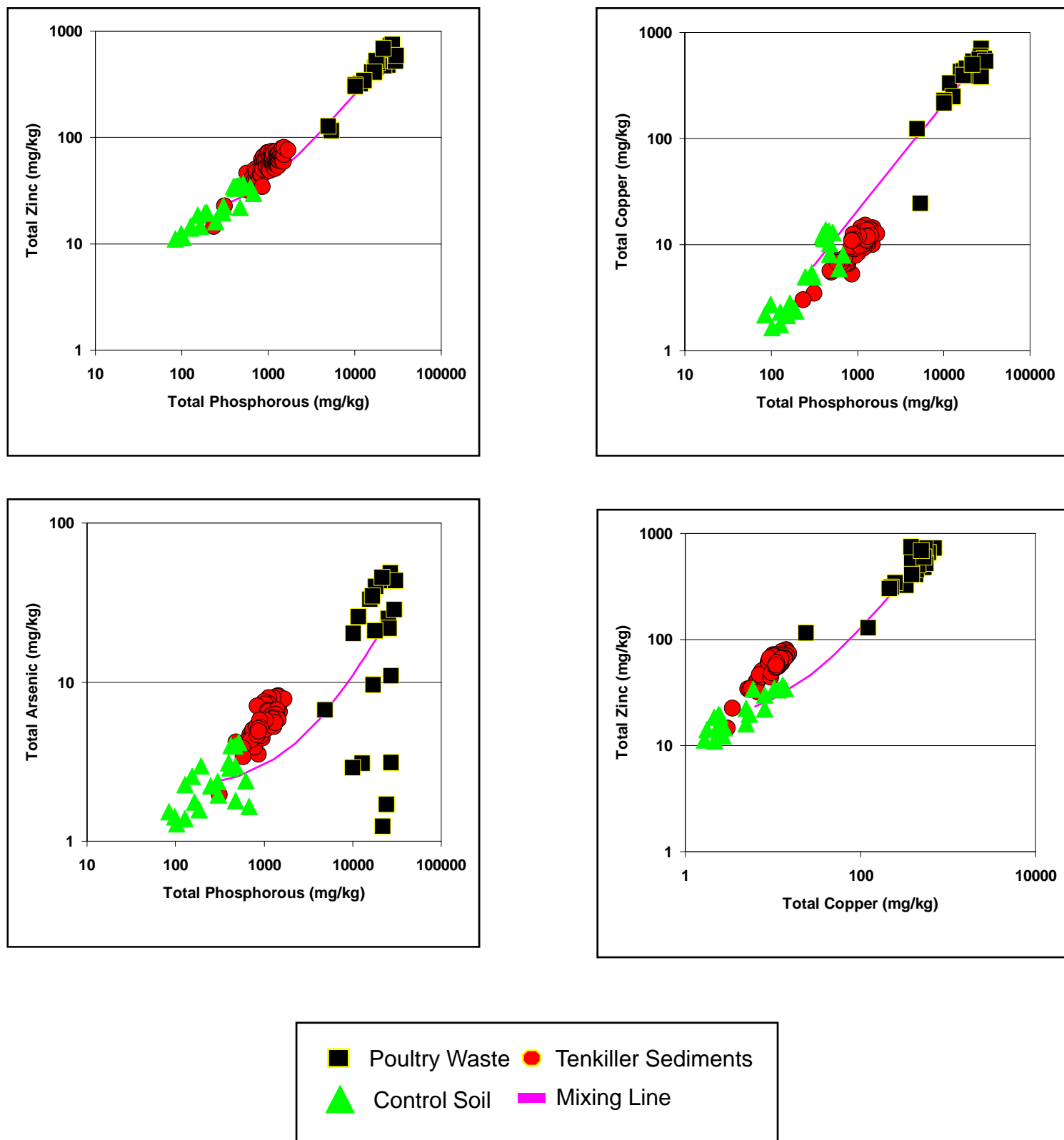


Figure 32. Relationship between the concentrations of total phosphorus, total copper, total zinc and total arsenic found in sediments collected in Lake Tenkiller sediment cores, uncontaminated soils and in poultry waste.